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42
A.D. 1914. FEB. 14. N^o 3891.
BARKER & another's COMPLETE SPECIFICATION.

(1 SHEET)

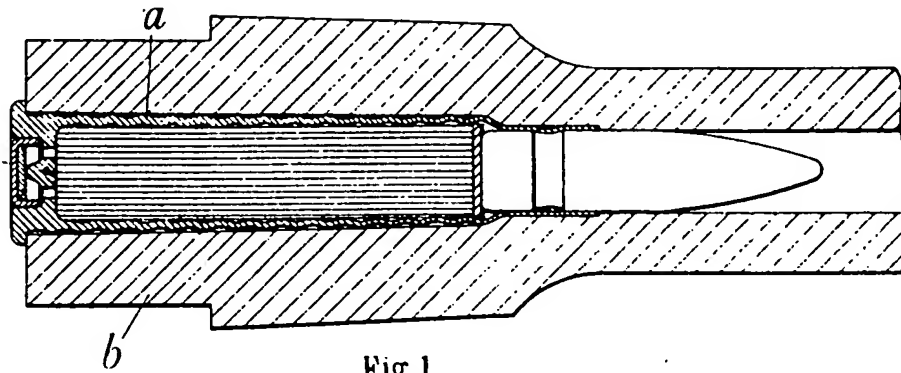


Fig. 1

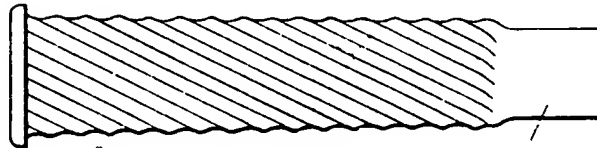


Fig. 2

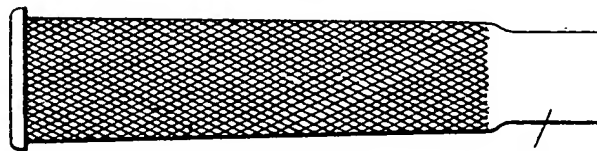


Fig. 3

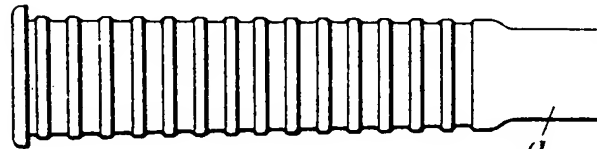


Fig. 4

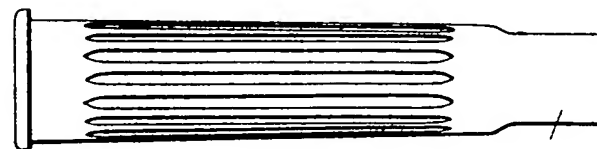


Fig. 5

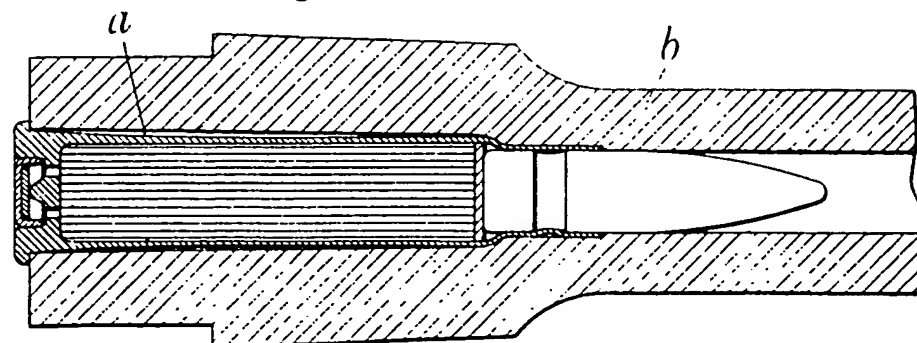


Fig. 6

N^o 3891



A.D. 1914

22
DUPLICATE

Date of Application, No. 3891, 14th Feb., 1914

" " No. 12,008, 15th May, 1914

Complete Specification Left, 13th Aug., 1914

(Section 16 of the Patents and Designs Act, 1907.)

Complete Specification Accepted, 14th Jan., 1915

PROVISIONAL SPECIFICATION.

No. 3891. A.D. 1914.

Improvements relating to Cartridges.

We, JOHN HENRY BARKER, Managing Director, and BIRMINGHAM METAL & MUNITIONS COMPANY LIMITED, Manufacturers, all of Adderley Park Rolling Mills, in the City of Birmingham, do hereby declare the nature of this invention to be as follows:—

5 When a rifle is fired a number of times in rapid succession the barrel sometimes becomes heated to such an extent that if a cartridge is inserted and allowed to remain for a short time before being fired the charge may be detrimentally affected by the heat and when fired is liable to explode with abnormal violence.

The object of the present invention is to diminish the communication of
10 heat from the barrel to the cartridge, and for this purpose comprises the construction of the cartridge case in such a manner that it makes contact with the barrel at a number of points or lines only. The invention further comprises the construction of the cartridge case or the disposition of the explosive charge
15 in such a manner that contact between the case and charge occurs also at a number of lines or points only. In both forms the construction is such that the area of metallic contact between the case and the barrel or between the case and the charge is made as small as possible and the intervening air space made as large as possible.

In one convenient construction of a cartridge for a service rifle in accordance
20 with this invention, the case of the cartridge is formed with a number of spiral flutes or ribs which whilst providing the necessary support for the cartridge within the barrel effect a considerable reduction of the amount of metallic contact between the case and the barrel obtained with an ordinary cartridge. "By" such a construction the transmission of heat from the barrel to the cartridge is very
25 largely reduced, this effect being due to the small area of metallic contact between the cartridge case and the barrel and probably to the intervening envelope of air.

The same result may be obtained by a variety of means. For example, spiral
30 flutes may be formed in both directions around the cartridge case so that contact between the case and the barrel is made at a number of points or small separated areas.

In other forms circumferential bearing rings or longitudinally arranged ribs are formed at suitable positions around the case.

In addition to providing a restricted area of contact between the cartridge
35 case and the chamber of the barrel it is also advantageous to reduce the area of contact between the cordite or like charge and the case. For this purpose the interior of the cartridge case may have an internal surface similar to the external surface, and the strands may be spirally arranged in the opposite

[Price 6d.]

Improvements relating to Cartridges.

direction to the spiral flutes in the interior, or the flutes may be circumferential, and the charge arranged with the strands parallel to the axis.

The invention is not limited to any particular manner for carrying it into effect, provided a minimum of contact between the cartridge and the barrel, and, if desired, between the cartridge and its explosive contents, is obtained. It is found that by constructing a cartridge case as above described the heat transmission between the barrel and cartridge experienced with ordinary smooth cartridges is very largely reduced and adequate protection is afforded against excessive heating of the cartridge contents.

The invention is not limited to cartridges for rifles.

Dated this 13th. day of February, 1914.

MARKS & CLERK.

PROVISIONAL SPECIFICATION.

No. 12,008, A.D. 1914.

Improvements in Cartridges and in Gun Chambers for use therewith.

We, JOHN HENRY BARKER, Managing Director, and the BIRMINGHAM METAL & MUNITIONS COMPANY LIMITED, Manufacturers, all of Adderley Park Rolling Mills, in the City of Birmingham, do hereby declare the nature of this invention to be as follows:—

In our Provisional Patent Application No. 3891 of 1914 we describe an invention for diminishing the heat communication from the barrel of the gun to the cartridge. After further experiments we find it is sufficient to so shape the cartridge case that it is supported in the gun at its front and rear extremities only, leaving an annular air space which extends throughout the whole or the greater part of the length of the cartridge case.

The present improvement consists in so shaping the cartridge or the gun barrel that the cartridge is supported as aforesaid.

For this purpose either the normal diameter immediately adjacent to each end is slightly increased or the normal dimensions are retained and the remainder of the cartridge is made slightly less. In either case the practical effect is to provide an abutment for the cartridge in the gun at the front and rear end only and produce an annular air space which completely surrounds the cartridge and effectively diminishes the heat communication from the barrel to the cartridge as described in the specification above mentioned. Obviously the same effect may be obtained by suitably chambering the bore of the gun. It is further evident that the means described in the prior specification for preventing the heat communication to the cartridge may be transferred to the gun, in which case the cartridges are made of normal form.

Dated this 14th. day of May, 1914.

MARKS & CLERK.

COMPLETE SPECIFICATION.

Improvements in Cartridges and in Gun Chambers for use therewith.

We, JOHN HENRY BARKER, Managing Director, and the BIRMINGHAM METAL & MUNITIONS COMPANY LIMITED, Manufacturers, all of Adderley Park Rolling

Improvements relating to Cartridges.

Mills, in the City of Birmingham, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

When a rifle is fired a number of times in rapid succession the barrel sometimes becomes heated to such an extent that if a cartridge is inserted and allowed to remain for a short time before being fired the charge may be detrimentally affected by the heat and when fired is liable to explode with abnormal violence.

The object of the present invention is to diminish the communication of heat from the barrel to the cartridge, and for this purpose the invention comprises the construction of the cartridge case or gun barrel in such a manner that the cartridge makes contact with the barrel at intervals, so that whilst effective support is given to the cartridge by the barrel, the area of metallic contact between the parts is made as small as possible. The invention further comprises the construction of the cartridge case or the disposition of the explosive charge in such a manner that contact between the case and charge occurs also at intervals.

Referring to the accompanying sheet of explanatory drawings:—

Figure 1 shows a sectional elevation and Figure 2 an external elevation of a cartridge constructed in accordance with this invention.

Figures 3, 4, 5, and 6 illustrate three other forms of our improved cartridge case.

In Figures 1 and 6 the cartridges are shown in position within the breech of an ordinary small arm.

The same reference letters in the different views indicate the same or similar parts.

In the construction of a cartridge for a service rifle as shown in Figures 1 and 2, the case of the cartridge *a* is formed with a number of spiral flutes or ribs which whilst providing the necessary support for the cartridge within the gun barrel *b* effect a considerable reduction of the amount of metallic contact between the case and the barrel obtained with an ordinary cartridge, the contact being along the ridges of the flutes only, except at the front and back end of the case. By such a construction the transmission of heat from the barrel to the cartridge is very largely reduced, this effect being due to the small area of metallic contact between the cartridge case and the barrel and probably to the intervening envelope of air.

The same result may be obtained by a variety of means. For example, spiral flutes may be formed in both directions around the cartridge case so that contact between the case and the barrel is made at a number of points or small separated areas. This effect may be obtained by cross spiral knurling or milling of the case as shown diagrammatically at Figure 3.

In other forms circumferential bearing rings or longitudinally arranged ribs or flutes are formed at suitable positions around the case. Figures 4 and 5 show annular bearing rings and longitudinal flutes respectively.

We find by experiment that it is sufficient to so shape the cartridge case that it is supported in the gun at its front and rear extremities only, leaving an annular air space which extends throughout the whole or the greater part of the length of the cartridge case. This is shown at Figure 6. Either the normal diameter of the case immediately adjacent to each end is slightly increased or the normal dimensions are retained and the remainder of the cartridge is made slightly less. In either case the practical effect is to provide an abutment for the cartridge in the gun at the front and rear end only and produce an annular air space which completely surrounds the cartridge and effectively diminishes the heat communication from the barrel to the cartridge. Obviously the same effect may be obtained by suitably chambering the bore of the gun, in which arrangement the cartridge case is made of normal form. It is further evident

Improvements relating to Cartridges.

that any of the means shown in Figures 1 to 5 for preventing the heat communication to the cartridge may be transferred to the gun, in which case also the cartridges are made of normal form.

In addition to providing a restricted area of contact between the cartridge case and the chamber of the barrel it is also advantageous to reduce the area of contact between the cordite or like charge and the case. For this purpose the interior of the cartridge case may have an internal surface similar to the external surface, and the strands may be spirally arranged in the opposite direction to the spiral flutes in the interior, or the flutes may be circumferential, and the charge arranged with the strands parallel to the axis.

The invention is not limited to any particular manner for carrying it into effect, provided a minimum of contact between the cartridge and the barrel, and, if desired, between the cartridge and its explosive contents, is obtained. It is found that by constructing a cartridge case as above described the heat transmission between the barrel and cartridge experienced with ordinary cartridges is very largely reduced and adequate protection is afforded against excessive heating of the cartridge contents.

The invention is not limited to cartridges for rifles, as it may be applied to other small guns using cartridges similar to those employed in rifles.

It has previously been proposed to form cartridge cases with spiral or other grooves or ribs whereby "the cases are made more durable and the cartridges more safe" (Patent Specification No. 3496 of 1874), also to form longitudinal, spiral or transverse grooves in the case so that the capacity of the case is increased on explosion by the expansion of the grooved parts to a cylindrical form corresponding with the remainder of the case (Patent Specification No. 4098 of 1878). Further, in ordnance it has been proposed to allow a considerable clearance between the cartridge case and the gun chamber and so prevent obstruction to the insertion or withdrawal of the case by sand or grit, the case being made to fit the gun chamber closely at each end. (Patent Specification No. 18,022 of 1900).

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. The construction of a rifle or like cartridge case or gun barrel in such a manner that the cartridge makes contact with the barrel only at intervals, so that whilst effective support is given to the cartridge by the barrel, the area of metallic contact between the parts is made as small as possible.

2. The construction of rifle or like cartridge cases or the disposition of the explosive charge therein so that contact between the case and the charge occurs only at intervals.

3. The construction of a rifle or like cartridge case or gun barrel with ribs, flutes, rings or the like, or with bearing parts occurring only at the ends of the case, substantially as described.

4. Rifle or like cartridge cases of the forms substantially as described and illustrated.

Dated this 12th day of August, 1914.

MARKS & CLERK.